HealthEM.AI streamlines and simplifies complex medical and practice management data from all points of care, allowing organizations to achieve strategic goals based on data insights and forecasts.
HealthEM.AI Offerings

SDoH Risk Model → Derives insights on health and well-being based on social determinants of health (conditions in which a person is born, grows, lives and works).

Predicted Cost Model → Predicts the development of a patient's healthcare costs over the next year and analyzes the factors that influence this prediction.

Member Retention Model → Identifies key drivers for retaining the existing population and targets promotions to sustain market share.

Hospital Admission Risk Model → Identifies which members in a population are most likely to be admitted to the hospital in the next 12 months.

Readmission Risk Model → Identifies which patients are most likely to be readmitted following a stay in the hospital.

ER Events Risk Score → Helps in the early detection of patients who are likely to have an emergency room visit or hospitalization in the next 12 months.
Potential Market Differentiators

- **AI/ML**
  - AI/ML models with better accuracy than industry standards (2-4x higher).

- **Price**
  - Cost-effective pricing models for small and medium-sized health plans.

- **Integration**
  - Integrated library of modules with chronic models to support informed clinical decisions.

- **Innovation**
  - Flexible delivery models and integration with **EMR**, **HL7**, APIs and custom applications.

- **Cloud**
  - Cloud-enabled technology for faster and scalable deployment of solutions.
Focus Areas

- Medicare Advantage Plans
- Provider Groups
- Commercial Contracts
- Specialty Services

Improving Population Health Management
Revamping Operations
Strengthening Innovation

Care Delivery
Chronic Care Management
Clinical Decision Support
Prevention & Wellness
Model Framework

**MODEL ACCURACY**
- Track model prediction accuracy via a selection of metrics - RMSE, MAPE, Precision, F1 Score, etc.
- Track model execution errors
- Helps in validating the correctness of model predictions

**DATA DRIFTS**
- Analysis of data and model drift with auto-triggered alerts
- Discover changes in data distribution that can potentially lead to model degradation
- Helps in validating the correctness of model predictions

**EXPLAINABLE AI**
- Explainable AI visualizes predictions for better understanding
- Builds trust in the model with its users
- Explains model output down to a single prediction

**PROVENANCE GRAPH**
- Visual graphs provide end-to-end visibility and traceability for model execution
- Expedites root cause identification of production issues
- Reduces dependency on DS/DE teams for production support
Azure Platform

Data Sources
- ERP/CRM
- Systems Data
- External Data
- Files

Data Ingestion
- Data Capture
- Data Integration
- Orchestration
- Incident Management
- Data Quality Management

Data Engineering
- Data Transformation
- Data Catalogue
- Data Lineage
- Data Validation

Model Development
- Model Development/Experiments
- Hyper Parameter Tuning
- Streamline Resource Provisioning
- Model Artifacts

Model Deployment
- Model Registry
- Model Testing
- Containerization and Packaging
- Automated Model Deployment

Model Monitoring
- Provenance Graph
- Model & Data Drift
- Model Explainability
- Alerts & Notifications
- Reporting

Azure Offering

HealthEM.AI Accelerators

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Data & Insights Healthcare Platform: Capability Architecture

### Solution Delivery

- **Front End Provisioning**
  - Front End Development
  - Analytical Report Development
  - Front End Interaction (User Interface)
  - Front End Interaction (API, etc.)

- **Logic and AI/ML Provisioning**
  - Logic Development
  - Logic Assembly Pipeline
  - AI/ML Model Development
  - AI/ML Feature and Scoring

### Platform Foundation

- **Data Management**
  - Data Provisioning
    - Data Model
    - Data Storage
    - Data Quality
    - Data Catalog and API Interaction

- **Data Source Gathering**
  - Data Source (File based)
  - Data Source (Relational DB)
  - Data Source (API based)
  - Data Source (Other/Stream/Batch)

- **Security/Compliance**
  - Identity and Access Management
    - Encryption (Data at Rest and Motion)
    - Customer Isolation
    - Legal and Regulatory Compliance
    - Data Lineage

- **Data Preservation and Archive**
  - Data Source Gathering
  - Data Provisioning
  - Logic and AI/ML Provisioning
  - Data Management

- **Platform Foundation**
  - Subscription Management
  - Software Code Repository Management
  - System Monitoring
  - Automated Code Deployment (CICD)
  - User Support
  - People Collaboration

- **IT Governance**
  - API Management
  - Job Scheduling
  - Alert and Notification
  - Issue Tracking and Identification
  - Continuous Improvement and SLA Tracking
Data & Insights Healthcare Platform: Technical Architecture

Sources
- Files
- Relational Database
- API
- Other/Streaming/Batch

Data Governance
- Scalable Data Storage
- Cleanse, Transform, Model
- KPI Derivation and AI/ML Capability

Security
- Data Quality
- Data Lineage
- Data Model
- Azure Active Directory
- Azure Key Vault

DevOps, CI/CD
- Azure Repos
- Azure DevOps Pipelines
- Azure VSTS
- Azure App Service

Logging & Monitoring
- Azure App Insights

Extract through API Connectors
- Load from SFTP
- Direct Database Connection

Reported Data Model
- Web App
- Azure API Gateway
- Power BI

Azure Data Factory to orchestrate the solution
Data & Insights Healthcare Platform: Security Solution

- Secure with TLS/SSL certificate
- Sign-on authentication by application interface
- API security through Azure API gateway
- Data access to storage within Tredence VNET
- Store application secrets in the key vault to securely access data

- Isolation of compute per customer through separate Databricks cluster
- Databricks and SQL DB authentication via Azure AD
- Separate SQL DB per customer enabling to compute customer-specific KPIs and measures
- Data access secured over Tredence VNET

- Data encryption at rest using Azure native security
- Data encryption in motion on Azure backbone network within Tredence VNET
- ADLS gen2 fine-grained security through service principal
- Separate DB per customer
- Data masking of key fields using dynamic data masking
HealthEM.AI Best Practices to Streamline

Project team represents different roles to meet the desired output/deliverables

Agile Development
- Product Manager
- Program Director
- SME

Continuous Flow Chart
- User Inputs
- Backlogs
- Final Product

Process
- 2 weeks

Project Phases
- Sprint Phrases
- Daily Scrum
- Sprint Review Retrospection
- Continuous Integration
- Continuous Delivery
- Continuous Testing

DevOps
- Continuous Feedback
- Commit
- Code Repository
- CI Server

Continuous Integration
- Build + Unit Test + Code Quality
- Repository Manager

Continuous Delivery
- DevOps Engineer
- MLOps Engineer
- ML Engineer

Continuous Testing
- QA Engineer
- DevOps Engineer
- Business User

Continuous Feedback
- Testing Metrics
- Issue Tracking
- Test Scripts
- Auto Ticket Creation
- Test Suite

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A complex program requires coordination across several teams and the appropriate governance controls for delivering a high-quality solution and sustaining it in the longer term.

<table>
<thead>
<tr>
<th>Continuous Feedback</th>
<th>Sprint Planning (Start of the Sprint)</th>
<th>Daily Scrum/Stand-up (Daily)</th>
<th>Sprint Review (End of the Sprint)</th>
<th>Sprint Retrospective (End of the Sprint)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML + Rule-based Data Consolidation</td>
<td>Data Review (As and when new market onboarded)</td>
<td>Model/Rules Review (Once in 2 weeks)</td>
<td>Accuracy Review (Ongoing)</td>
<td></td>
</tr>
<tr>
<td>Model Deployment</td>
<td>Release Plan (At the end of PI Planning)</td>
<td>Test Calendar (Per Project Plan)</td>
<td>Deployment Planning (Per the Project Plan)</td>
<td>Knowledge Transition Plan (Per the Project Plan)</td>
</tr>
<tr>
<td>Program Management</td>
<td>Prog. Planning Workshop (Start of the Program)</td>
<td>Program Increment Planning (Monthly)</td>
<td>Scrum of Scrums (Weekly)</td>
<td>Steerco Review (Once every 2 weeks)</td>
</tr>
</tbody>
</table>
We Follow a Robust Process to Ensure Smooth Process Transition and Maintenance.

The maintenance cost is determined by the projected level of engagement from the solution support team.

**Rigorous Planning**
- Discovery phase (experts guiding the scope definition process)
- Opportunities, risks, stakeholders, process gaps, data gaps, use case definition
- Migration planning

**Seamless Takeover**
- Crawl-walk-run process to ensure ample time for process understanding
- Prioritization framework to ensure critical processes take precedence

**Uptime & Support**
- Detailed SLA framework to ensure streamlined processes
- Ticketing system for tracking of issues
- Infrastructure management – backup, recovery, uptime
- Health monitoring

**Cost Improvement & Optimization**
- Automation to increase efficiency
- Improved productivity
- Process transformation & continuous improvement
- Cost optimization & spend analysis

**Continuous Transformation**
- Automation scripts
- Reusable execution scripts
- Performance logs

**What we do**

**Key deliverables**
- Detailed scope & specifications document
- Automation assessment
- Business continuity plan
- Risk assessment matrix
- Stakeholder map for communication

**Benefits**
- Avoid surprises during execution
- Involve all relevant people

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Thank You